Docket No.: 520.43709X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:

Masaaki HOSOUCHI et al.

Serial No. 10/811,923

Filed: March 30, 2004

For: REMOTE COPY CONTROL METHOD

PETITION TO MAKE SPECIAL
UNDER 37 CFR §1.102(MPEP §708.02)

May 31, 2005

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants hereby petition the Commissioner to make the above-identified application special in accordance with 37 CFR §1.102(d). Pursuant to MPEP §708.02(VIII), Applicants state the following.

(A) This Petition is accompanied by the fee set forth in 37 CFR §1.17(h). The Commissioner is hereby authorized to charge any additional payment due, or to credit any overpayment, to Deposit Account No. 50-1417.

(B) All claims are directed to a single invention. If the Office determines that all claims are not directed to a single invention, Applicant will make an election without traverse as a prerequisite to the grant of special status.

(C) A pre-examination search has been conducted.

The search was directed to the invention set forth in claims 1-20. The invention is directed, at a minimum, to a remote copy control method for remotely copying a plurality of volumes formed in a plurality of disk subsystems, the remote copy control method, comprising: obtaining an identifier of a first disk subsystem of a first volume, the first volume being a copy source or a copy destination of a volume pair as a remote copy target in the disk subsystems, for a host computer connected to at least one of the disk subsystems, based on a volume pair list for registering an identifier of the first volume and an identifier of the first disk subsystem of the first volume; searching route information including the identifier of the first disk subsystem based on a route list including the route information for registering an identifier of a plurality of second disk subsystems for relay as a command transmitting route for the first disk subsystem and information for determining an identifier of the third disk subsystem connected to a host computer among the second disk subsystems, and obtaining an identifier of the third disk subsystem expressed by the searched route information; and issuing, to the third disk subsystem corresponding to the obtained identifier, a remote copy command of the first volume including, in input information, the identifier of the second disk subsystem and the identifier of the first disk subsystem.

The search of the above features was conducted in the following areas: class 707, subclasses 200 and 204, class 709, subclasses 213 and 238-241, class 711, subclasses 112, 114, 147, 161 and 162 and class 719, subclass 325.

Additionally, a computer database search was conducted on the USPTO system EAST.

(D) The following is a list of the references deemed most closely related to the subject matter encompassed by the claims:

U.S. Patent Number	Inventors
6,230,200	Forecast et al.
6,574,667	Blumenau et al.

U.S. Patent Publication No.	Inventor(s)
2004/0225697	Asano et al.
2004/0254964	Kodama et al.

Foreign Patent No.	Inventor(s)
JP 08-328760	Hitoshi et al.

A copy of each of these references (as well as other references uncovered during the search) is enclosed in an accompanying IDS.

(E) It is submitted that the present invention is patentable over the references for the following reasons.

It is submitted that the cited references, whether considered alone or in combination, fail to disclose or suggest the invention as claimed. In particular,

the cited references, at a minimum, fail to disclose or suggest an identifier of a first disk subsystem of a first volume, and/or a volume pair list for registering an identifier of the first volume and an identifier of the first disk subsystem of the first volume, and/or an identifier of a plurality of second disk subsystems for relay as a command transmitting route for the first disk subsystem and information for determining an identifier of a third disk subsystem connected to the host computer among the second disk subsystems, an/or identifiers of different disk controllers in a volume pair list for registering an identifier of a first volume as a copy source or a copy destination in a volume pair of a remote copy target in the disk controllers, and/or a disk controller path list comprising a set of the identifiers of a pair of disk controllers, and/or a route list including route information including the identifier of the host computer, the identifier of the third disk controller, and the identifier of a fourth disk controller different from the identifier of the third disk controller in the set including the identifier of the third disk controller, and/or when the identifier of the first disk subsystem does not match an identifier of a third disk subsystem which receives a remote copy command, obtaining route information including the identifier of the first disk subsystem from a route list for registering route information on an identifier of a fourth disk subsystem which can transmit the remote copy command from the third disk subsystem.

All of the independent claims recite at least one of these features or this feature, if there is only one. In particular, independent claim 1 recites obtaining an identifier of a first disk subsystem of a first volume, a volume pair list for

registering an identifier of the first volume and an identifier of the first disk subsystem of the first volume, and searching route information including the identifier of the first disk subsystem based on a route list including the route information for registering an identifier of a plurality of second disk subsystems for relay as a command transmitting route for the first disk subsystem and information for determining an identifier of a third disk subsystem connected to the host computer among the second disk subsystems. Independent claim 6 recites extracting identifiers of the different disk controllers from a volume pair list for registering an identifier of a first volume as a copy source or a copy destination in a volume pair of a remote copy target in the disk controllers and an identifier of a first disk controller including the first volume, generating a disk controller path list comprising a set of the identifiers of a pair of disk controllers, the pair having at least one of a first identifier and a second identifier of the disk controllers, which is different from those of another pair, serving as a volume pair included in the volume pair list, and generating a route list including route information including the identifier of the host computer, the identifier of the third disk controller, and the identifier of a fourth disk controller different from the identifier of the third disk controller in the set including the identifier of the third disk controller.

Independent claim 12 recites extracting all volume pairs having at least one different identifier of an adapter of a first volume as a copy source or a copy destination of a remote copy target volume pair in the disk controller, from a list of all designated volume pairs for registering one and/or a plurality of the

identifiers of the first volume and the adapter. Independent claim 13 recites transmitting first route information including an identifier of a first disk controller for a second disk controller having a logical path to the first disk controller, and transmitting, to the first disk controller, second route information additionally having an identifier of the second disk controller in the first route information, by the second disk controller which receives the first route information. Independent claim 14 recites obtaining an identifier of a first disk subsystem of a first volume as a copy source or a copy destination of a volume pair as a remote copy target in the disk subsystem, by referring to a volume pair list for registering an identifier of the first volume, and when the identifier of the first disk subsystem does not match an identifier of a third disk subsystem which receives the remote copy command, obtaining route information including the identifier of the first disk subsystem from a route list for registering route information on an identifier of a fourth disk subsystem which can transmit the remote copy command from the third disk subsystem and transmitting the remote copy command to the fourth disk subsystem indicated by the route information. Independent claim 15 recites inquiring an identifier of the first disk controller with an identifier of a third disk controller including a volume as a transmittal destination of the remote copy command, and obtaining, from the route information, route information including the identifier of the third disk controller including the volume as the transmittal destination of the remote copy command.

Independent claim 16 recites a memory for storing a volume pair list and a route list, the volume pair list for holding an identifier of a first volume as a copy

source or a copy destination of remote copy and an identifier of a first disk subsystem of the first volume, and the route list for holding route information including information for determining an identifier of the host computer, the identifier of the first disk subsystem, an identifier of a second disk subsystem for relay as a transmitting route of the command to the first disk subsystem from the host computer, or an identifier of a third disk subsystem connected to the host computer among the second disk subsystems, and means for searching the route information including the first disk subsystem by referring to the route list and for obtaining the identifier of the third disk subsystem included in the route information. Independent claim 19 recites loading, to a main memory, a volume pair list for registering an identifier of a first volume as a copy source or a copy destination of remote copy and an identifier of a first disk subsystem of the first volume, loading, to the main memory, a route list for holding route information including information for determining an identifier of the host computer, the identifier of the first disk subsystem, an identifier of a second disk subsystem for relay as a transmitting route of a command to the first disk subsystem from the host computer, and an identifier of a third disk subsystem connected to the host computer among the second disk subsystems, and searching route information including the first disk subsystem by referring to the route list and obtaining the identifier of the third disk subsystem included in the route information. Independent claim 20 recites preparing, in a memory, a volume pair list including an identifier of a first volume as a copy source or a copy destination of a volume pair as a remote copy target in the disk controllers and an identifier of a first disk

controller including the first volume, preparing, in the memory, a disk controller path list comprising a set of the identifiers of a pair of disk controllers, the pair having at least one of a first identifier and a second identifier of the disk controllers, which is different from those of another pair, serving as a volume pair included in the volume pair list, preparing, in the memory, a route list including route information including the identifier of the host computer, the identifier of the second disk controller, and an identifier of a third disk controller different from the identifier of the second disk controller included in the set including the identifier of the second disk controller, and searching route information including the first disk controller by referring to the route list and obtaining an identifier of a fourth disk controller as the copy destination included in the route information.

The references considered most closely related to the claimed invention are briefly discussed below:

The patent to Forecast et al., US 6230200, discloses an allocation program that creates a list indicating a route through a file server for a data stream (in RAID). A command is provided for copying data from a video file server to a remote storage system. (See, e.g., column 2, lines 52-65; column 28, lines 36-49; and Figures 2-5.) However, unlike the present invention, Forecast et al. do not disclose, at a minimum, an identifier of first disk subsystem of first volume. Furthermore, Forecast et al. do not disclose registering an identifier of a plurality of second disk subsystems for relay as a command transmitting route for the first disk subsystem and a third disk subsystem.

The patent to Blumenau et al., US 6574667, discloses a routing table 46 for dynamic routing storage access requests from host processors through a switch to a data storage subsystem. Each entry of the routing table 46 includes an identifier of a next storage port for a loop to access. (See, e.g., column 8, lines 20-50; column 12, lines 22-28; column 13, lines 31-36; Figures 2-4 and 8-9.) However, unlike the present invention, Blumenau et al. do not disclose registering an identifier of a plurality of second disk subsystems for relay as a command transmitting route for the first disk subsystem and a third disk subsystem. Furthermore, Blumenau et al. do not disclose, at a minimum, a volume pair list and third disk subsystem.

The published patent application to Asano et al., US 20040225697, discloses a route information table 510 for managing information of the route of the data network used for replicating the volume. The table 510 includes a route ID 511 as an identifier representing the replication route between storages. An associated pair 515 identifies a replication pair of the volumes using the route and a policy 516 representing the properties of the route. A storage ID 212 represents an identifier of the storage to which the volume belongs. A storage volume ID 213 represents an identifier of the volume managed inside each storage in the storage device. A pair information table 230 includes PAIR ID 231. (See, e.g., paragraphs 37, 38, 68-69, 71, 77, 85-87, and 110; and Figures 1-5.) However, unlike the present invention, Asano et al. do not disclose, at a minimum, registering an identifier of a plurality of second disk subsystems for

relay as a command transmitting route for the first disk subsystem and a third disk subsystem.

The published patent application to Kodama et al., US 20040254964, discloses a first identifier 605 for specifying an addressable data portion ID, a second identifier 607 for specifying a further addressable ID. An original volume ID 605 and a copied volume ID 607 pair identify the specific volumes to be paired. A virtual volume manager 521b adds a map 704 with predetermined rules/parameters for allowing or not allowing access attempts in a RAID device. (See, e.g., paragraphs 103-105, and 109-113; and Figures 5-6.) However, unlike the present invention, Kodama et al. do not disclose, at a minimum, an identifier of a plurality of second disk subsystems for relay as a command transmitting route for the first disk subsystem and a third disk subsystem, and a search route list.

The Japanese Patent to Hitoshi et al., JP 08-328760, discloses hierarchy control rafters 5 inside a DAC 4 which access a routing table inside a cache memory 7 and recognize an entry corresponding to a sequence ID. (See, e.g., Abstract and Figure.) However, unlike the present invention, Hitoshi et al. do not disclose, at a minimum, registering an identifier of a plurality of second disk subsystems for relay as a command transmitting route for the first disk subsystem and a third disk subsystem. Furthermore, Hitoshi et al. do not disclose a volume pair list.

Therefore, since the references fail to disclose an identifier of a first disk subsystem of a first volume, and/or a volume pair list for registering an identifier of the first volume and an identifier of the first disk subsystem of the first volume, and/or an identifier of a plurality of second disk subsystems for relay as a command transmitting route for the first disk subsystem and information for determining an identifier of a third disk subsystem connected to the host computer among the second disk subsystems, an/or identifiers of different disk controllers in a volume pair list for registering an identifier of a first volume as a copy source or a copy destination in a volume pair of a remote copy target in the disk controllers, and/or a disk controller path list comprising a set of the identifiers of a pair of disk controllers, and/or a route list including route information including the identifier of the host computer, the identifier of the third disk controller, and the identifier of a fourth disk controller different from the identifier of the third disk controller in the set including the identifier of the third disk controller, and/or when the identifier of the first disk subsystem does not match an identifier of a third disk subsystem which receives a remote copy command, obtaining route information including the identifier of the first disk subsystem from a route list for registering route information on an identifier of a fourth disk subsystem which can transmit the remote copy command from the third disk subsystem, it is submitted that all of the claims are patentable over the cited references.

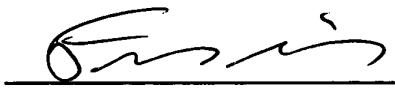
CONCLUSION

Applicant has conducted what it believes to be a reasonable search, but makes no representation that "better" or more relevant prior art does not exist. The Patent Office is urged to conduct its own complete search of the prior art, and to thoroughly examine this application in view of the prior art cited herein and any other prior art that the Patent Office may locate in its own independent search. Further, while Applicant has identified in good faith certain portions of each of the references listed herein in order to provide the requisite detailed discussion of how the claimed subject matter is patentable over the references, the Patent Office should not limit its review to the identified portions but rather, is urged to review and consider the entirety of each reference, and not to rely solely on the identified portions when examining this application.

In view of the foregoing, Applicant requests that this Petition to Make Special be granted and that the application undergo the accelerated examination procedure set forth in MPEP 708.02 VIII.

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



Frederick D. Bailey
Registration No. 42,282

FDB/sdb
(703) 684-1120

IPW

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PETITION FEE
Under 37 CFR 1.17(f), (g) & (h)
TRANSMITTAL
(Fees are subject to annual revision)

Send completed form to: Commissioner for Patents
P.O. Box 1450, Alexandria, VA 22313-1450

Application Number	**10/811,923**
Filing Date	**March 30, 2004**
First Named Inventor	**Masaaki HOSOUCHI et al.**
Art Unit	**2186**
Examiner Name	**Not yet assigned**
Attorney Docket Number	**520.43709X00**

Enclosed is a petition filed under 37 CFR 1.102(d) that requires a processing fee (37 CFR 1.17(f), (g), or (h)). Payment of $ 130.00 is enclosed.

This form should be included with the above-mentioned petition and faxed or mailed to the Office using the appropriate Mail Stop (e.g., Mail Stop Petition), if applicable. For transmittal of processing fees under 37 CFR 1.17(i), see form PTO/SB/17i.

Payment of Fees (small entity amounts are NOT available for the petition (fees)

☒ The Commissioner is hereby authorized to charge the following fees to Deposit Account No. 50-1417:

☐ petition fee under 37 CFR 1.17(f), (g) or (h) ☒ any deficiency of fees and credit of any overpayments

Enclose a duplicative copy of this form for fee processing.

☐ Check in the amount of $ _____ is enclosed.

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Petition Fees under 37 CFR 1.17(f): **Fee $400** **Fee Code 1462**

For petitions filed under:
§ 1.53(e) - to accord a filing date.
§ 1.57(a) - to according a filing date.
§ 1.182 – for decision on a question not specifically provided for.
§ 1.183 – to suspend the rules.
§ 1.378(e) for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in an expired patent.
§ 1.741(b) – to accord a filing date to an application under §1.740 for extension of a patent term.

Petition Fees under 37 CFR 1.17(g): **Fee $200** **Fee code 1463**

For petitions filed under:
§1.12 - for access to an assignment record.
§1.14 - for access to an application.
§1.47 - for filing by other than all the inventors or a person not the inventor.
§1.59 - for expungement of information.
§1.103(a) - to suspend action in an application.
§1.136(b) - for review of a request for extension of time when the provisions of section 1.136(a) are not available.
§1.295 - for review of refusal to publish a statutory invention registration.
§1.296 - to withdraw a request for publication of a statutory invention registration filed on or after the date the notice of intent to publish issued.
§1.377 – for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of a patent.
§1.550(c) – for patent owner requests for extension of time in ex parte reexamination proceedings.
§1.956 – for patent owner requests for extension of time in inter partes reexamination proceedings.
§ 5.12 – for expedited handling of a foreign filing license.
§ 5.15 – for changing the scope of a license.
§ 5.25 – for retroactive license.

Petition Fees under 37 CFR 1.17(h): **Fee $130** **Fee Code 1464**

For petitions filed under:
§1.19(g) – to request documents in a form other than that provided in this part.
§1.84 – for accepting color drawings or photographs.
§1.91 – for entry of a model or exhibit.
§1.102(d) – to make an application special.
§1.138(c) – to expressly abandon an application to avoid publication.
§1.313 – to withdraw an application from issue.
§1.314 – to defer issuance of a patent.

Name (Print/Type)	**Frederick D. Bailey**	*Registration No. (Attorney/Agent)*	**42,282**
Signature		*Date*	May 31, 2005